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<u>Claims after this response:</u>

1(Original). An apparatus comprising:

a quantum absorber comprising a material having first and second low energy states coupled to a common high energy state, transitions between said first low energy state and said common high energy state or between said second low energy state being induced by electromagnetic radiation;

an electromagnetic radiation source that generates electromagnetic radiation having first and second CPT-generating frequency components, said first CPT-generating frequency component having a frequency ν_L-ν, and a first CPT component amplitude and said second CPT -generating frequency component having a frequency ν_L+ν and a second CPT component amplitude, said first and second CPT-generating frequency components irradiating said quantum absorber;

a detector for generating a detector signal related to the power of electromagnetic radiation that leaves said quantum absorber, said detector signal exhibiting an asymmetry as a function of frequency ν in a frequency range about a frequency ν_0;

a CPT servo loop that alters ν in response to said detector signal; and

an asymmetry servo loop that alters one of ν_L, said first CPT component amplitude, and said second CPT component amplitude in a manner that reduces said asymmetry.

2(Original). The apparatus of Claim 1 further comprising an EM frequency control circuit that determines ν_L, said EM control circuit being responsive to an EM frequency control signal.

3(Original). The apparatus of Claim 2 wherein said asymmetry servo loop alters said EM frequency control signal.

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4(Original). The apparatus of Claim 1 wherein said electromagnetic radiation source further generates additional frequency components for altering an AC Stark shift in said quantum absorber, said additional frequency components having amplitudes and/or frequencies that are determined by a Stark shift control signal,

and wherein said apparatus further comprises an AC Stark shift servo loop for generating said Stark shift control signal.

5(Original). The apparatus of Claim 1 wherein said electromagnetic radiation source comprises:

a source that generates electromagnetic radiation having a frequency ν_L in response to a first signal; and

a modulator that modulates said generated electromagnetic radiation at a frequency determined by a second control signal.

6(Original). The apparatus of Claim 5 wherein said modulator also modulates the phase or frequency and amplitude of said generated radiation in a manner determined by a third control signal and wherein said asymmetry servo loop alters one of said second and third control signals.

7(Original). The apparatus of Claim 5 wherein said source comprises a laser.

8(Original). The apparatus of Claim 1 wherein said electromagnetic radiation source comprises first and second phase-locked lasers.

9(Original). The apparatus of Claim 1 wherein said first and second energy states of said quantum absorber differ in energy by an amount that is a function of an externally applied electromagnetic field.

10(Original). The apparatus of Claim 1 wherein said quantum absorber comprises hydrogen, or an alkali metal or an ion from group IIA and IIB, or Yb^+.

11(Original). The apparatus of Claim 10 wherein said alkali metal is an isotope selected from the group consisting of lithium, sodium, potassium, rubidium, and cesium.

12(Original). The apparatus of Claim 10 wherein said ion is an isotope selected from the group consisting of Be^+, Mg^+, Ca^+, Sr^+, Ba^+, Zn^+, Cd^+, Hg^+, and Yb^+.

13(Original). A method for measuring CPT comprising:

irradiating a quantum absorber comprising a material having first and second low energy states coupled to a common high energy state, transitions between said first low energy state and said common high energy state or between said second low energy state being induced by electromagnetic radiation with electromagnetic radiation having first and second CPT-generating frequency components, said first CPT-generating frequency component having a frequency ν_L-ν, and a first CPT component amplitude and said second CPT generating frequency component having a frequency $\nu_L+\nu$ and a second CPT component amplitude, said first and second CPT-generating frequency components irradiating said quantum absorber;

generating a detector signal related to the power of electromagnetic radiation that leaves said quantum absorber, said detector signal exhibiting an asymmetry as a function of frequency ν in a frequency range about a frequency ν_0;

altering ν in response to said detector signal; and

altering one of ν_L, said first CPT component amplitude, and said second CPT component amplitude in a manner that reduces said asymmetry.

14(Original). The method of Claim 13 wherein ν_L is altered by altering an EM control signal that controls ν_L in response to said detector signal.

15(Original). The method of Claim 13 further comprising generating additional frequency components to reduce an AC Stark shift in said quantum absorber.

16(Original). The method of Claim 13 wherein said electromagnetic radiation is generated by modulating electromagnetic radiation from an electromagnetic radiation source.

17(Original). The method of Claim 16 wherein said electromagnetic radiation source has a frequency ν_L and is modulated at a frequency ν.

18(Original). The method of Claim 16 wherein said electromagnetic radiation source comprises a laser.

19(Original). The method of Claim 13 wherein said electromagnetic radiation is generated by first and second phase-locked laser.

20(Original). The method of Claim 13 wherein said first and second energy states of said quantum absorber differ in energy by an amount that is a function of an externally applied electromagnetic field.

21(Original). The method of Claim 13 wherein said quantum absorber comprises hydrogen, an alkali metal or an ion from group IIA and IIB or Yb^+.

22(Original). The method of Claim 21 wherein said alkali metal is an isotope selected from the group consisting of lithium, sodium, potassium, rubidium, and cesium.

23(Original). The method of Claim 21 wherein said ion is an isotope selected from the group consisting of Be^+, Mg^+, Ca^+, Sr^+, Ba^+, Zn^+, Cd^+, Hg^+, and Yb^+.